



Light and Color Doodle Notes

Use the following slides to fill in your doodle notes.
Remember to add color to key words, concepts, and/or examples.

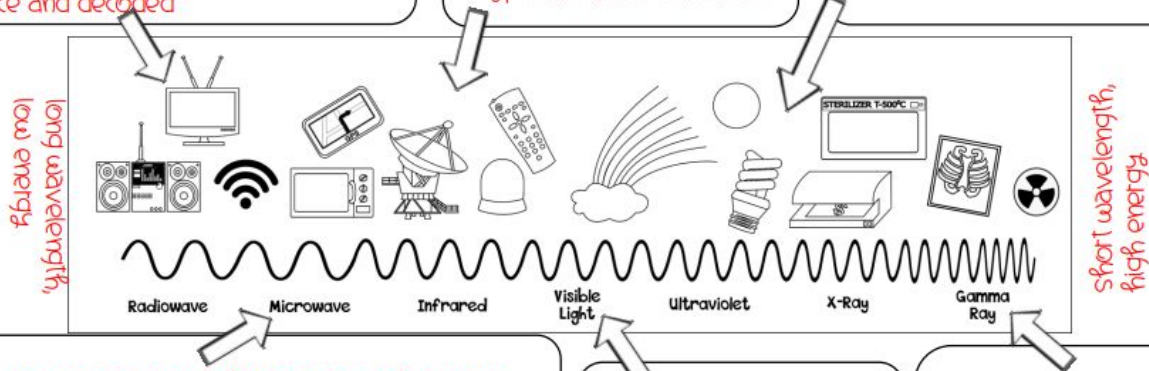


THE ELECTROMAGNETIC SPECTRUM

communication technology encodes a pattern on electromagnetic radiation which is transmitted to another device and decoded

living things including humans produce heat, a type of infrared radiation

a light bulb produces two types of radiation: visible light and infrared



microwaves use radiation to transfer energy to your food and warm it up. the microwaves are converted to thermal energy

the only part of the electromagnetic spectrum we can see

radioisotopes produce gamma rays and can be used to treat some cancers

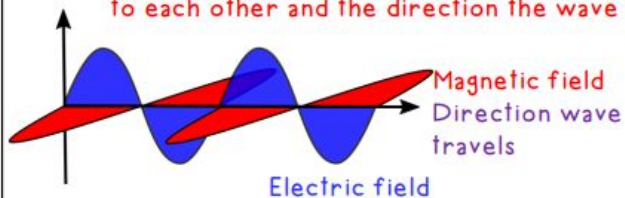
What types of electromagnetic radiation have you interacted with today? Where did the radiation come from?

the sun is the most important source of electromagnetic radiation on earth. it produces all of the energy needed to support life.



TRANSVERSE WAVES

The electric and magnetic fields are perpendicular to each other and the direction the wave travels



MADE OF: electric & magnetic FIELDS

- Transfer energy from one place to another
- Can transfer energy through matter or Through empty space

TRAVEL AT the speed of light

It takes **8** minutes for waves from the sun to reach Earth

ELECTROMAGNETIC WAVES

INTERACTIONS:



ABSORB

DIFFRACT

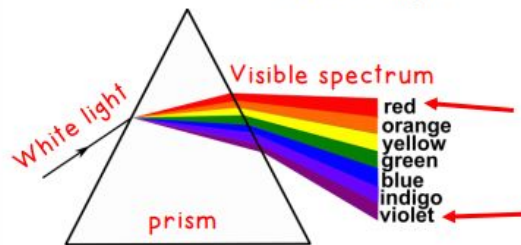
Spread around

How are electromagnetic waves different from mechanical (water) waves?



Mechanical waves need a medium to travel through, electromagnetic waves do not

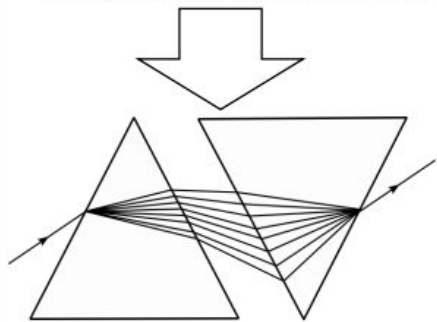
in the 17th century sir isaac newton used a prism to show that sunlight was a combination of many different colours of light



Red has the longest wavelength

Violet has the shortest wavelength

Each colour of light has a different wavelength. The prism refracts(bends) different wavelengths different amounts.



Placing a second prism in front of the first causes the light rays to recombine back into white light

how do we see color?

- When light hits an object some colours are reflected (bounce off) and others are absorbed
- We see the colour being reflected back to our eyes



Reflects red



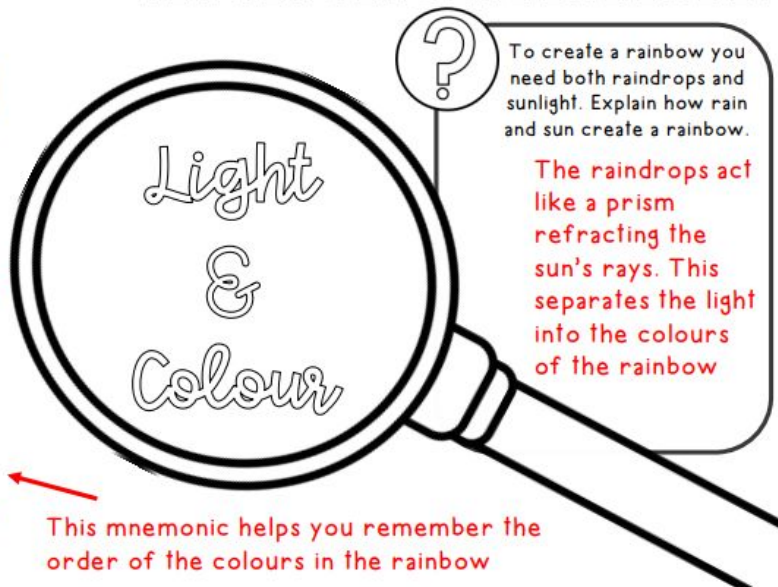
Reflects all colours



Reflects no colours

R
O
Y
G
B
I
V

This mnemonic helps you remember the order of the colours in the rainbow



To create a rainbow you need both raindrops and sunlight. Explain how rain and sun create a rainbow.

The raindrops act like a prism refracting the sun's rays. This separates the light into the colours of the rainbow

There are three kinds of light:

1 VISIBLE LIGHT

Between infrared and ultraviolet light. This is the light we can see.



2 INFRARED

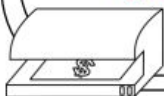
Longest wavelength of light. Can be felt as heat



3 ULTRAVIOLET

Shortest wavelength of light.

Can be harmful to cells



In space there are very few particles and they are very, very far apart. How would travelling in space affect sound? What about light?

A sound wave would not be able to travel – there is no medium for it to vibrate. Light waves could travel because they do not need a medium.



- Does not need a medium (can travel in empty space)
- Electromagnetic energy
- Transverse wave
- Travels fast.



COMPARING *Light* AND SOUND WAVES

- Sound waves transfer energy from a vibrating object through matter
- Mechanical energy
- Longitudinal wave
- Travels slower than light. Speed depends on properties of the medium

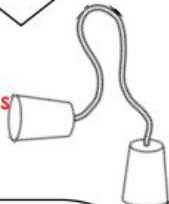
CHARACTERISTICS OF SOUND

- As sound travels away from a source the energy it carries



- Sound travels better through solids and liquids than air

A tin can phone uses a string to transfer sound waves



When the strings of a



They push against the particles in the air creating a wave



The vibrations move through the air as a longitudinal wave to your ears